REMARKS

This is in response to the Office Action dated February 8, 2007. In view of the foregoing amendments and following representations, reconsideration is respectfully requested.

Initially, the specification and abstract have been reviewed and revised, and a substitute specification and abstract has been prepared. <u>No new matter has been added</u>. Also enclosed is a "marked-up" copy of the original specification and abstract to show the changes that have been incorporated into the substitute specification and abstract. The enclosed copy is entitled "*Version with Markings to Show Changes Made*."

Further, by the above amendment, claims 1-6 have been amended. Thus, claims 1-6 are currently pending in the present application.

In the previous Office Action, claim 1 is rejected under 35 U.S.C.§ 102(b) as being anticipated by the Admitted Prior Art illustrated in Figs. 6A-6B of the present application. Claims 2-6 are objected to but would be allowable if rewritten in independent form. In this regard, claim 2 has been rewritten in independent form, and thus claims 2-6 are clearly allowable.

Claim 1 has been amended to more clearly define the novel features of the present invention. The language of the original claims may have led to the rejection of the original claim in view of the Admitted Prior Art.

To anticipate a claim, a prior art reference must disclose every limitation of the claimed invention, either explicitly or inherently. See <u>Glaxo Inc. v. NOVA Pharm Ltd.</u>, 52 F.3d 1043, 1047, 34 USPQ 2d 1565, 1567 (Fed. Cir. 1995).

The present invention, as defined in amended claim 1, requires, *inter alia,* a plurality of input devices for receiving sound, a plurality of output devices for broadcasting the sound, and a controller interconnected with the input and output devices through a network. As shown in Fig. 6A (AAPA) the input devices are connected with the output devices via the controller 30. The input devices and output devices are clearly not interconnected with the controller through a network as required in claim 1. Furthermore, there is no disclosure in the Admitted Prior Art

description to anticipate the limitation requiring the controller to be operative to deliver routing data to all of the input devices. In particular, claim 1 requires that the controller, in response to a broadcasting request from an arbitrary one of set input devices, delivers routing data to all of the input devices indicative of a combination of the one input device, which has made the broadcasting request, and the output device or devices that should broadcast the sound from the one input device. This feature is described on page 3, line 26 to page 4, line 15 of the present specification. Since the broadcasting system shown in Fig. 6A does not disclose each and every limitation of claim 1, it is submitted that claim 1 cannot be anticipated by the Admitted Prior Art under 35 U.S.C. § 102(b).

In view of the above, it is submitted that the present application is now clearly in condition for allowance. The Examiner therefore is requested to pass this case to issue.

In the event that the Examiner has any comments or suggestions of a nature necessary to place this case in condition for allowance, then the Examiner is requested to contact Applicant's undersigned attorney by telephone to promptly resolve any remaining matters.

Respectfully submitted,

Akihiro SUZUKI

By:_____

Michael S. Huppert
Registration No. 40,268
Attorney for Applicant

MSH/kjf
Washington, D.C. 20006-1021
Telephone (202) 721-8200
Facsimile (202) 721-8250
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~~SPECIFICATION~~

DIGITAL BROADCASTING SYSTEM

5   ~~TECHNICAL FIELD~~

BACKGROUND OF THE INVENTION

1.   Technical Field

The present invention relates to a digital broadcasting
system which has input devices and output devices connected

10   in a network form, and more particularly, to a broadcasting
system which can monitor the system for operating conditions.

~~BACKGROUND ART~~

2.   Description of Related Art

Fig. 6A generally illustrates a conventional

15   broadcasting apparatus. In this broadcasting apparatus, a
plurality of, for example, four input devices 11 - 14 are
connected to a plurality of, for example, four output devices
21 - 24 through a controller 30 called a "matrix controller."
Here, the input device refers to an arbitrary audio signal

20   feeding device including a sound source device such as a CD
player, a cassette deck, an audio file device and the like,
and a microphone terminal, while the output device refers to
an audio output device including an amplifier which has a
speaker connected to the output side thereof. In a building

25   and the like, the input devices 11 - 14 and output devices 21

- 24 are installed in each floor, a management room, or the like.

The controller 30 controls which of the input devices 11 - 14 inputs sound and delivers the sound to which of the output devices 21 - 24. For implementing this control, the controller 30 contains a table which represents the relationships between the input devices 11 - 14 and output devices 21 - 24 in a matrix form, and stores a plurality of destinations in groups. An example of this table is shown in Fig. 6B. A black circle in the table indicates which of the output devices generates sound delivered from which of the input devices. For example, sound delivered from the input device 11 is output from the output devices 21 and 22, while sound delivered from the input device 12 is not output from any output device. In this event, the output devices 21 and 22 are registered as Group 1, so that the controller 30 selects Group 1 when it receives sound, for example, from the input device 11, thereby causing the output devices 21, 22 to output the sound from the Input device 11. In this way, the controller 30 stores in a one-to-one correspondence the relationships between input devices and groups of output devices which output sound from an associated input device, and is responsive to a request from an input device to instruct output devices registered as included in a group corresponding to the input device to output sound from the

input device.

When priorities are set to broadcast contents, even if a certain program is on air, this program is switched to a program with a higher priority when the higher priority program is started. A program with a lower priority may be, for example, a BGM (background music) program, while a calling program, for example, is set a higher priority. While such priorities may be set for each input device, an input device may be provided with a function of selecting a priority in accordance with broadcast contents.

As described above, it is the controller 30 that specifies a destination and a group, but alternatively, the input devices 11 - 14 may be each provided with a controller for specifying an output device which is the destination. Fig. 7 illustrates the appearance of an input device which contains such a controller. In Fig. 7, an input device 40 comprises a microphone 42 implanted on a housing 41; and a broadcasting switch 43, group selection switches 44, and indicators 45 arranged in the housing 41. The broadcasting switch 43 is a switch for indicating the start and end of broadcasting. The group selection switches 44 are associated with respective groups, so that a switch corresponding to a group which should deliver input sound is depressed for broadcasting. As one of the group selection switches 44 is depressed, an indicator 45 associated therewith is lit to

indicate a group which is currently on air. The controller in Fig. 7 is generally used to specify and start a desired program, and a lit one of indicators 45 permits the operator to recognize of which of the groups a currently broadcast

5   program is associated with.

As described above, the controller 30 illustrated in Fig. 6A simply controls the relationships between input devices and output devices in accordance with a matrix table, and the controller 40 in Fig. 7 is similar in simply

10   selecting a destination and indicating a group currently on air. In other words, the input devices 11 - 14 simply deliver an audio signal to an output device specified thereby or by the controller 30. In a modification to the foregoing, a request may be made from an output device to an input

15   device, such that the input device delivers an audio signal in response to the request. However, in any case, the conventional broadcasting apparatus fails to notify the user of the priority of the broadcasting, specifically, which has a higher priority, a currently broadcast program or a program

20   to be broadcast by the user from now on, thus giving rise to a problem that the user cannot know whether or not his program can be broadcast.

SUMMARY ~~DISCLOSURE~~ OF THE INVENTION

The present invention has been proposed to solve the

25   problems of the conventional broadcasting apparatus as

described above, and it is an object of the invention to provide a broadcasting system which is capable of monitoring all input devices for their operating conditions.

To achieve the above object, the present invention provides a broadcasting system having at least one input device for receiving sound, at least one output device for broadcasting the sound, and a controller interconnected through a network, the broadcasting system characterized in that:

the controller, in response to a broadcasting request from an arbitrary one of the input devices, delivers routing data indicative of a combination of the input device which has made the broadcasting request with the output device which should broadcast the sound from the input device to all of the input devices.

According to one embodiment of the present invention, the controller may comprise a broadcasting pattern table which records a plurality of patterns indicative of combinations of source input devices with destination output devices, wherein the controller may force the input devices to register the plurality of broadcasting patterns when the input devices are initially set.

Each of the input devices may comprise a storing means for registering the plurality of broadcasting patterns.

The input device may comprise broadcasting pattern

selection switches for selecting one of the plurality of
broadcasting patterns, and display units corresponding
one-to-one to the broadcasting pattern selection switches.

The routing data may include priority data indicative
5   of a priority thereof, wherein the display unit of each input
device, upon receipt of the routing data from the controller,
may make a display based on the priority data included in the
routing data.

The input device may comprise comparing means operative
10   when the routing data is received for comparing the routing
data with the plurality of broadcasting patterns, wherein the
input device may display the result of the comparison made by
the comparing means on the display unit.

The above and other objects and advantages of the
15   present invention will be more clearly understood from
detailed description of the invention when read with
reference to the accompanying drawings.

<u>BRIEF DESCRIPTION OF THE DRAWINGS</u>

Fig. 1 is a diagram generally illustrating the
20   configuration of one embodiment of a broadcasting system
according to the present invention;

Fig. 2 is a diagram for outlining the control conducted
by a controller in Fig. 1;

Fig. 3 is a flow diagram illustrating the operation
25   performed by an input device in Fig. 1;

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Fig. 4 is a diagram showing exemplary broadcasting pattern data delivered from the controller at step S101 in Fig. 3;

Fig. 5 is a diagram showing exemplary routing data received by an input device at step S105 in Fig. 3;

Fig. 6A is a diagram generally illustrating the configuration of a conventional broadcasting apparatus, and Fig. 6B is a table showing exemplary combinations of input devices with output devices; and

Fig. 7 is a diagram illustrating an exemplary specific configuration of conventional input devices.

DETAILED DESCRIPTION OF ~~BEST MODE FOR CARRYING OUT~~ THE INVENTION

In the following, one embodiment of a broadcasting system according to the present invention will be described with reference to Figs. 1 to 5. Fig. 1 is a diagram generally illustrating the whole configuration of one embodiment of the broadcasting system according to the present invention, where a plurality of input devices 1_1, 1_2, ..., 1_M are connected to a plurality of output devices 3_1, 3_2, ..., 3_N through a communication network 2, and a controller 4 is connected to the communication network 2.

Each of the input devices 1_1, 1_2, ..., 1_M has an operation panel which is provided with a plurality of broadcasting pattern selection switches (not shown) for

selecting a desired combination from possible broadcasting

patterns which can be provided by all the input devices, i.e.,

from all possible combinations of input devices, which are

sources, with output devices which are destinations; and a

5   display unit (not shown) for indicating which broadcasting

pattern is in operation, together with a priority. Each of

the broadcasting pattern selection switches is assigned a

pattern number, similar to the group selection switches in

Fig. 7. The broadcasting pattern selection switches and

10   display unit will be described again in connection with Fig.

4. The output devices 3_1 - 3_N may be the same as the output

devices 21 - 24 in Fig. 6A.

The communication network 2 is, for example, Ethernet

which is used in general computer networks. An audio signal

15   applied to any of the input devices 1_1 - 1_M is converted into

digital data and divided into packets in the input device,

and broadcast from a predetermined output device 3_1, 3_2, ...,

or 3_N, which should receive the audio signal from the input

device, through the communication network 2. When the

20   packets are sent from any of the input devices 1_1 - 1_M,

information for identifying a destination output device 3_1,

3_2, ..., or 3_N, for example, an IP address is added to each

packet as header information. The output device assembles

the packets sent thereto in order to restore the original

25   digital data which is converted to an analog form for

reproducing the audio signal. Such real time audio communication processing performed between the input devices 1_1 - 1_M and output devices 3_1 - 3_N is known as streaming.

As previously described, conventionally, sound is

5   transmitted to an output device specified by an input device, or a request is sent from an output device to an input device, and the input device sends the sound in response. The simple delivery of sound from an input device does not allow the user to know which program is currently broadcast. To

10 eliminate this disadvantage, in the broadcasting system of Fig. 1, the controller 4 conducts a routing control.

To implement the routing control, the controller 4 contains a broadcasting pattern table which records broadcasting patterns that represent combinations of input

15 devices with output devices which should broadcast sound from the respective input devices, and priorities given to the combinations. Thus, upon receipt of a broadcasting request from any of the input devices 1_1, 1_2, ..., 1_M, the controller 4 conducts the routing control which involves

20 assigning one or a plurality of predetermined output devices 3_1, 3_2, ..., or 3_N which should broadcast the sound from the input device, which has requested the broadcasting, with reference to the broadcasting pattern table, and bringing the assigned output device(s) into an operative sate state.

25 Simultaneously, the controller 4 issues routing data, i.e.,

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data indicative of a combination of the source with the
destination, assigned by the controller 4 at that time, to
all the input devices 1_1 - 1_M. The input device which has
made the broadcasting request executes the broadcasting based

5   on the received routing data. This procedure is
schematically illustrated in Fig. 2, wherein a double-head
dotted-line arrow indicates that signal is communicated
between an input device and the controller; a single-head
dotted-line arrow indicates that an output device is

10 controlled by the controller; and a solid-line arrow
indicates that sound from the input device is amplified by an
amplifier of the output device and then broadcast from
speakers.

The controller 4 sends the routing data to all the

15 input devices 1_1 - 1_M, to enable the broadcasting system of
Fig. 1 to set priorities to the broadcasting for conducting a
priority-based control and to indicate an operating condition
of the system and the priority in each of the input devices
1_1 - 1_M. In this way, the respective input devices can

20 broadcast in accordance with their priorities.

Fig. 3 is a flow diagram for explaining the operation
of an arbitrary input device 1_1, 1_2, ...,or 1_M. In Fig. 3,
the input device registers a broadcasting pattern at step
S101. Specifically, the input device receives broadcasting

25 pattern data including the routing data from the controller 4

in the event of initial settings such as power-on, and preserves the received broadcasting pattern data in a buffer. This buffer comprises a broadcasting pattern data buffer (buffer A) and a routing data buffer (buffer B).

5   At step S101, the controller 4 sends the broadcasting pattern data respectively corresponding to all previously set broadcasting patterns to the input device l_1, l_2, ...,or l_M which are initially set. Fig. 4 shows an example of data preserved in the buffer A and buffer B of an arbitrary input

10   device. In this example, each broadcasting data includes an SW number, a pattern number, a pattern priority, the number of routings, a routing data address, a source, and a destination, wherein the SW number, pattern number, pattern priority, number of routings, and routing data address are

15   preserved in the buffer A, while the routing data indicative of the source and destination is preserved in the buffer B.

Describing items included in each broadcasting pattern data, the pattern number is a number unique to each broadcasting pattern data for use in identifying a

20   broadcasting pattern. The SW number corresponds to the pattern number, and indicates a number assigned to a broadcasting pattern selection switch provided in each of the input devices l_1 - l_M. The pattern priority indicates a priority given to a broadcasting pattern, by which priorities are set to all broadcasting patterns. The number of routings

25

indicates the number of combinations of sources with
destinations, included in a single broadcasting pattern. The
routing data address indicates the start address of a storage
area in the buffer B for preserving the routing data

5   corresponding to the broadcasting pattern data. Therefore,
the buffer B preserves a number of combinations of sources
with destinations as much as the number of routings.

Turning back to Fig. 3, after the broadcasting pattern
has been registered at step S101, the input device enters a

10 broadcasting enabled condition, and awaits prior to making a
broadcasting request at step S102. Then, when the
broadcasting is started from the input device, any of the
broadcasting pattern selection switches is depressed to
select one broadcasting pattern (step S103), and a

15 broadcasting request signal including a pattern signal
indicative of the selected broadcasting pattern is sent to
the controller 4 (step S104).

In response to the broadcasting request signal, the
controller 4 performs the routing processing based on the

20 pattern signal, and sends routing data to all the input
devices, including the input device which has requested the
broadcasting, and to all output devices which should
broadcast sound of the input device which has requested the
broadcasting. As shown in Fig. 5, the routing data includes

25 a number of data, each comprised of the broadcasting source,

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destination and routing priority as much as the number of
routings for the broadcasting pattern selected by the input
device. Upon receipt of the routing data at step S105, the
input device which has requested the broadcasting starts

5   broadcasting at step S106, packetizes the sound, and delivers
the packetized sound to an output device identified by the
received routing data.

When the input device terminates the broadcasting, the
input device delivers a broadcasting termination request

10   signal to the controller 4 at step S107. In response, the
controller 4 again sends routing data at step S108, and the
input device terminates the broadcasting when it receives the
routing data, and waits for the next broadcasting (step S109).

As described above, the controller 4, in response to a

15   broadcasting request from one input device, delivers the
routing data to all the input devices 1_1 - 1_M and to an
output device which should broadcast sound from the input
device which has made the broadcasting request. In other
words, the reception of the routing data at step S105 in Fig.

20   3 is performed in all the input devices 1_1 - 1_M. Then, upon
receipt of the routing data from the controller 4, each input
device 1_1, 1_2, ... or 1_M fully compares routing data
preserved in its buffer B with the routing data received from
the controller 4 to determine whether or not there is the

25   same destination. In other words, the input device

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determines whether the destinations in the received routing data fully or partially match destinations registered in the associated broadcasting pattern selection switch, or do not match the destinations. Then, the input device operates a display unit in accordance with the result of the comparison. For example, when the input device receives routing data with pattern number 2, the input device operates a display unit associated with a broadcasting pattern selection switch related to the broadcasting pattern corresponding to the pattern number 2. In this way, the input device can display in real time the broadcasting conditions established by all the input devices including itself, as well as can know whether the priority of a program broadcast at that time is higher or lower than that of a program broadcast by the input device itself.

Specifically, the display unit provided on the operation panel of each input device 1_1, 1_2, ... or 1_M is comprised of indicator lamps "on air" indicating that a program provided by a source is being broadcast and received at all the destinations; "partially on air" indicating that the program provided by the source is broadcast and received by some of the destinations; and "not broadcasted" indicating that the program provided by the source is not broadcast, and indicator lamps indicating that the priority is "higher" than its own; "the same" as its own; and "lower" than its own.

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The input device can display the broadcasting conditions using the states of these indicator lamps (lit, unlit, flashed, and the like)and changes in display colors of the indicator lamps.

5   While one embodiment of the broadcasting system according to the present invention has been described above, the present invention is not limited to this embodiment. For example, while the routing data of the broadcasting pattern data has been described as stored in a different buffer as 10   shown in Fig. 4, a single buffer may be used by recording the routing data in the area of the routing data address instead thereof. Also, the display unit of each input device may provide graphical displays using an LCD panel, a display, or the like.

15   INDUSTRIAL AVAILABILITY

As will be understood from one embodiment of the broadcasting system according to the present invention described in detail, since the routing data sent from the controller to an input device which has made a broadcasting 20   request is delivered to all other input devices so that each input device holds the routing data, the present invention provides an appreciable advantage in that each input device can monitor the entire system for broadcasting conditions without additionally using a signal for displaying operating 25   conditions of the input devices.

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ABSTRACT

~~For providing a~~ A broadcasting system which can monitor

5   all input devices for their operating conditions, the

broadcasting system ~~comprises at least one~~includes input

devices 1_1 - 1_M for receiving sound, ~~at least one~~ output

devices 3_1 - 3_N for broadcasting sound, and a controller ~~4,~~

~~which~~ 4. These features are interconnected through a network

10   2. In response to a broadcasting request from an arbitrary

input device, the controller 4 delivers routing data

indicative of a combination of the input device, which has

made the broadcasting request, with an output device which

should broadcast the sound from the input device to all the

15   input devices 1_1 - 1_M. The routing data includes priority

data indicative of a priority thereof, so that a display unit

of each input device makes a display based on the priority

data included in the routing data when it receives the

routing data from the controller 4.